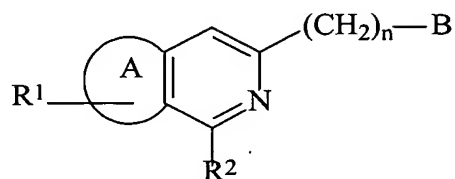


Claims

1. A compound represented by the following formula, its pharmaceutically acceptable salt or hydrates thereof



wherein,

ring A represents a pyridine ring;

R¹ represents a hydrogen atom, a halogen atom, a lower alkyl group or a lower alkoxy group;

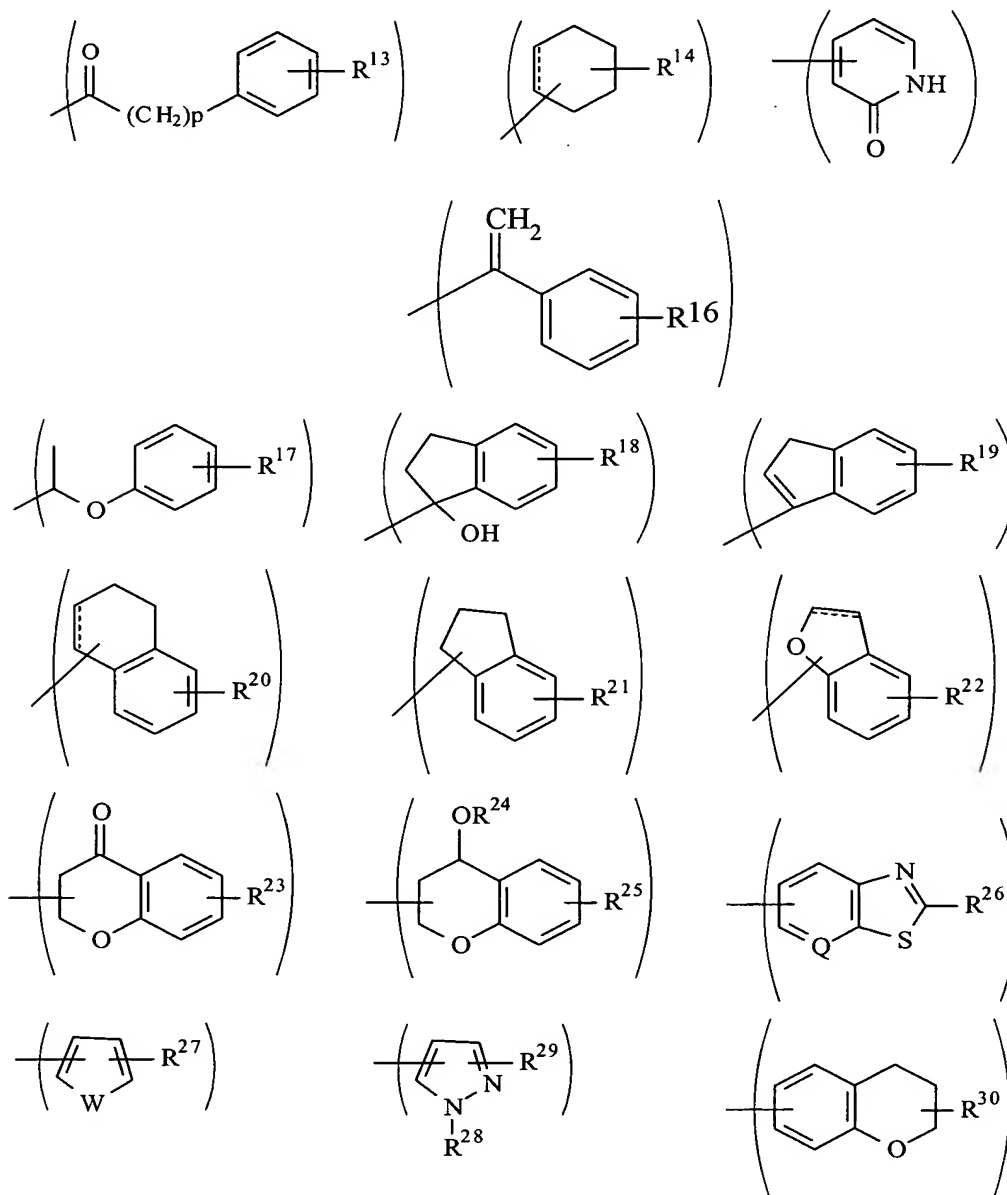
R² represents a 1-R⁴-piperazin-4-yl group;

R⁴ represents a hydrogen atom, a lower alkyl group, a hydroxy lower alkyl group, a halogenated lower alkyl group, a lower cycloalkyl group, an aryl group, an aralkyl group, a 1-piperidyl group, an alkenyl group, a cyano lower alkyl group, a carbamoyl lower alkyl group, a lower acyl group, an aromatic acyl group, a lower alkoxy carbonyl group, an aryloxy carbonyl group or an aralkyloxy carbonyl group;

n represents 0 or an integer of 1 to 6; and

B represents an optionally substituted aryl group, an optionally substituted aralkyloxy group, an aryl(hydroxy)alkyl group, an aromatic acyl amino group, an arylsulfonylamino group, a lower alkoxy arylsulfonylamino group, a hydroxy lower alkoxy styryl group, a lower alkoxy aryloxy group, a 4-phenylpiperidin-1-yl group, a 4-pyridylpiperidin-1-yl group, an arylalkenyl group, an arylalkynyl group, an aromatic acyl alkynyl group, an optionally N-substituted amino lower alkyl group, an optionally substituted

arylamino group, an optionally substituted aralkylamino group or a group selected from the groups represented by the following formulae:



wherein p represents 0 or an integer of 1 to 6;

R^{13} , R^{14} , R^{16} , R^{17} , R^{18} , R^{19} , R^{20} , R^{21} , R^{22} , R^{23} , R^{25} , R^{27} and R^{29} independently represent a hydrogen atom, a halogen atom, a hydroxyl group, a lower alkyl group, a lower alkoxy group, a hydroxy lower alkyl group, a hydroxy lower alkoxy group or tetrahydropyranyl group;

R^{24} represents a hydrogen atom or a lower alkyl group;

R²⁶ represents a hydrogen atom or a hydroxy lower alkyl group;

R²⁸ represents a hydrogen atom or a lower alkyl group;

R³⁰ represents a hydrogen atom, a lower alkyl group, a lower alkoxy group, a hydroxy lower alkyl group or a hydroxy lower alkoxy group;

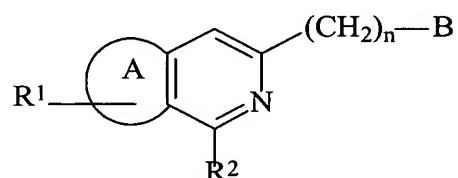
W represents sulfur atom or oxygen atom; and

the bond represented by the following formula:



is a single or double bond.

2. A compound represented by the following formula, its pharmaceutically acceptable salt or hydrates thereof



wherein,

ring A represents a pyridine ring;

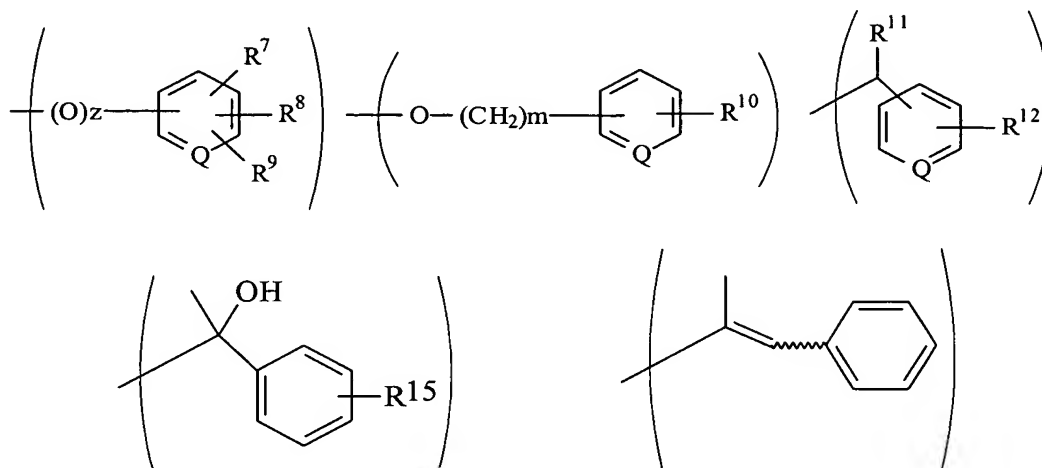
R¹ represents a hydrogen atom, a halogen atom, a lower alkyl group or a lower alkoxy group;

R² represents a 1-R⁴-piperazin-4-yl group;

R⁴ represents a hydrogen atom, a lower alkyl group, a hydroxy lower alkyl group, a halogenated lower alkyl group, a lower cycloalkyl group, an aryl group, an aralkyl group, a 1-piperidyl group, an alkenyl group, a cyano lower alkyl group, a carbamoyl lower alkyl group, a lower acyl group, an aromatic acyl group, a lower alkoxy carbonyl group, an aryloxy carbonyl group or an aralkyloxy carbonyl group;

n represents 0 or an integer of 1 to 6; and

B represents a group selected from the groups represented by the following formulae:



wherein z represents 0 or 1;

Q represents a nitrogen atom or a methine group;

R⁷, R⁸ and R⁹ are the same as or different from each other and each represents a hydrogen atom, a halogen atom, a hydroxyl group, a lower alkyl group, a lower alkenyl group, a lower alkynyl group, a lower alkoxy group, a lower thioalkoxy group, a hydroxy lower thioalkoxy group, an arylthio group, a heteroarylthio group, a heteroaryl(hydroxy)alkyl group, a halogenated lower alkyl group, a hydroxy lower alkyl group, a dihydroxy lower alkyl group, a halogenated (hydroxy) lower alkyl group, a hydroxyalkenyl group, a hydroxyalkynyl group, a hydroxy lower cycloalkenyl group, a lower alkoxy(hydroxy)alkyl group, a lower alkoxy(hydroxy)alkoxy group, a lower alkoxyalkyl group, a lower alkoxyalkoxy group, a lower thioalkoxyalkoxy group, a lower alkylsulfonylalkoxy group, a hydroxy lower alkoxy group, a dihydroxy lower alkoxy group, a hydroxy lower alkylalkoxy group, a hydroxyimino lower alkyl group, a lower cycloalkyl (hydroxy) alkyl group, an aralkyl group, a hydroxyaralkyl group, a cyano group, a cyano lower alkyl group, an amide

group, an N-lower alkylamide group, an N-lower cycloalkylamide group, an N,N-di lower alkylamide group, an N-hydroxy lower alkylamide group, an N-hydroxy lower alkyl-N-lower alkylamide group, an N-arylamide group, a cyclic aminocarbonyl group, a carbamoyl group, an N-lower alkyl carbamoyl group, an N,N-di lower alkyl carbamoyl group, an aminosulfonyl group, a cyclic aminosulfonyl group, an N-lower alkylaminosulfonyl group, an N-lower cycloalkylaminosulfonyl group, an N,N-di lower alkylaminosulfonyl group, an N-hydroxy lower alkylaminosulfonyl group, an N-lower alkoxyalkylaminosulfonyl group, an N-halogenated lower alkylsulfonyl group, a pyrrolidinylsulfonyl group, a lower alkylsulfonylaminoalkyl group, an N-lower alkylaminosulfonylalkyl group, an N,N-di lower alkylaminosulfonylalkyl group, a lower acyl group, a lower acylalkyl group, a lower cycloalkyl(hydroxy)methyl group, a tetrahydropyranyl group, a hydroxytetrahydropyranyl group, a hydroxy lower alkyltetrahydropyranyl group, a lower acylaminoalkyl group, a (thiazol-2-yl)hydroxymethyl group, a di(thiazol-2-yl)hydroxymethyl group, a lower alkylsulfonyl group, a lower alkoxyalkylsulfonyl group, a hydroxy lower alkylsulfonyl group, a lower alkylsulfonylalkyl group, an N-lower alkylamidealkyl group, an aryl group, an aralkyl group, a heteroaryl group, a heteroaryl lower alkyl group, a heteroaryl lower alkoxy group, a heteroarylsulfonyl group, a 4-morpholinylsulfonyl group, a 4-oxythiomorpholinylsulfonyl group, a 4-dioxythiomorpholinylsulfonyl group, a 4-morpholinylsulfonyl group, a hydroxy lower cycloalkyl group, a hydroxy lower cycloalkyloxy group, a hydroxycycloalkenyl group, a halogenated hydroxy lower

alkyl group, a 4-hydroxypiperidyl group, a 4-lower alkoxy piperidyl group, an ω,ω -lower alkylenedioxyalkyl group, an ω,ω -lower alkylenedioxyalkoxy group, a lower cycloalkylhydroxymethyl group, an aryloxy group, an arylaminosulfonyl group, amino group, a lower alkylamino group, a di lower alkylamino group, a hydroxy lower alkylamino group, a lower acylamino group, a hydroxy lower acylamino group, a lower alkylsulfonylamino group, a pyridyl lower alkoxy group, a lower alkylpyridylalkoxy group, a lower alkoxyhydroxyalkoxy group, a lower thioalkoxyalkoxy group, a lower alkylsulfonylalkoxy group, an N-lower alkylcarbamoyl group, an N,N-di lower alkylcarbamoyl group, an N-hydroxy lower alkylcarbamoyl group, an N-hydroxy lower alkyl-N-lower alkylcarbamoyl group, a halogenated lower alkoxy group, a cyano lower alkoxy group, a hydroxy lower cycloalkoxy group, trifluoromethyl group, a trifluoromethoxy group, an amino lower alkoxy group, an N-lower alkyl aminoalkoxy group, an N,N-di lower alkylaminoalkoxy group, a lower acylalkoxy group, a lower acylaminoalkoxy group, a (1,3-dioxolanyl) lower alkyl group, a (1,3-dioxolanyl) lower alkoxyl group, an amido lower alkoxyl group, a 4-(hydroxyalkyl)tetrahydropyran-4-yl group, a 2,3-dihydrobenzofuranyl group, a 2-hydroxy-2-alkyl-2,3-dihydrobenzofuranyl group, an indanonyl group, a hydroxyindanyl group, an imidazolyl lower alkoxyl group, a succinimide group or a 2-oxazolidon-3-yl group; furthermore, R^7 represents a hydrogen atom, while R^8 and R^9 form a cyclopentanone ring, a hydroxycyclopentane ring, a hydroxyalkylcyclopentane ring, a cyclohexanone ring, hydroxycyclohexane ring, a hydroxyalkylcyclohexane ring, a 2-hydroxymethyl-2-methylcyclopentanone ring, a 1,2-ethylenedioxy ring or a methylenedioxy ring;

m or p represents 0 or an integer of 1 to 6;
R¹⁰ and R¹² independently represent a hydrogen atom, a halogen atom, a hydroxyl group, a lower alkyl group, a lower alkoxy group, a hydroxy lower alkyl group, a hydroxy lower alkoxy group or a tetrahydropyranyl group;
R¹¹ represents a hydrogen atom, a halogen atom, a hydroxy group, a lower alkyl group or a lower alkoxy group;
W represents sulfur atom or oxygen atom; and
the bond represented by the following formula:



is a trans or cis bond.

3. The compound as claimed in one of Claims 1 and 2, wherein R¹ is a hydrogen atom.

4. The compound as claimed in one of Claims 1 and 2, wherein R⁴ is ethyl.

5. The compound as claimed in one of Claims 1 and 2, wherein B is phenyl, pyridyl, phenyloxy, or pyridyloxy, each of which may be substituted by up to three substituents selected from the group consisting of halogen atoms, lower alkoxy groups, halogenated lower alkyl groups, hydroxy lower alkyl groups, dihydroxy lower alkyl groups, lower alkoxy(hydroxy)alkyl groups, lower alkoxy(hydroxy)alkoxy groups, lower alkoxyalkyl groups, lower alkoxyalkoxy groups, hydroxy lower alkoxy groups, dihydroxy lower alkoxy groups, lower cycloalkyl (hydroxy) alkyl groups, cyano groups, N-lower alkylaminosulfonyl groups, N-lower cycloalkylaminosulfonyl groups, lower acylalkyl groups, hydroxytetrahydropyranyl groups, lower acylaminoalkyl groups, 4-morpholinylsulfonyl groups,

hydroxy lower cycloalkyl groups ω,ω -lower alkylenedioxyalkoxy groups, hydroxy lower acylamino groups, lower alkylsulfonylamino groups, halogenated lower alkoxy groups, cyano lower alkoxy groups, N,N-di lower alkylaminoalkoxy groups, and lower acylalkoxy groups.

6. The compound as claimed in one of Claims 1 and 2, wherein B is phenyl, pyridyl, phenyloxy, or pyridyloxy, each of which may be substituted by up to three substituents selected from the group consisting of lower alkoxy(hydroxy)alkoxy groups, lower alkoxyalkoxy groups, hydroxy lower alkoxy groups, and dihydroxy lower alkoxy groups.

7. A pharmaceutical composition which comprises a pharmaceutically effective dose of the compound as claimed in Claim 1 or 2, its pharmaceutically acceptable salt or hydrates thereof, and pharmaceutically acceptable carriers.

8. A pharmaceutical composition for treating or ameliorating spastic paralysis, which comprises the compound as claimed in Claim 1 or 2, its pharmaceutically acceptable salt or hydrates thereof as the active ingredient, in association with a pharmaceutically acceptable carrier.

9. A pharmaceutical composition for use as a muscle relaxant, which comprises the compound as claimed in Claim 1 or 2, its pharmaceutically acceptable salt or hydrates thereof as the active ingredient, in association with a pharmaceutically acceptable carrier.

10. A method for treating spastic paralysis or for ameliorating myotonia, which comprising the step of administering to a patient a pharmaceutically effective dose of the compound as claimed in Claim 1 or 2, its pharmaceutically acceptable salt or hydrates thereof.